

CLAIMS

What is claim is:

1. A thin-film transistor structure, at least essentially mainly
5 comprising:
 - an insulating substrate;
 - a gate electrode on said insulating substrate;
 - a dielectric layer over said gate electrode;
 - a first semiconductive layer on said dielectric layer;
 - 10 a second semiconductive layer on said first semiconductive layer;
 - a first conductive layer on said second semiconductive layer;
 - a second conductive layer on said first conductive layer, said second
conductive layer is used as a source and a drain;
 - a third conductive layer on said second conductive layer; and
 - 15 an opening through said second semiconductive layer, said first
conductive layer, said second conductive layer and said third conductive
layer and exposing said first semiconductive layer.
2. The thin-film transistor structure according to claim 1, wherein
20 said gate electrode comprises an AlNd gate electrode.
3. The thin-film transistor structure according to claim 1, wherein said
dielectric layer comprises a silicon nitride layer.

4. The thin-film transistor structure according to claim 1, wherein said first semiconductive layer comprises a hydrogenated amorphous silicon layer.

5 5. The thin-film transistor structure according to claim 1, wherein said second semiconductive layer comprises an N-type amorphous silicon layer.

6. The thin-film transistor structure according to claim 1, wherein said first conductive layer prevent said second conductive layer and said
10 second semiconductive layer from diffusing into each other.

7. The thin-film transistor structure according to claim 1, wherein said third conductive layer is used as a glue layer and protects said second conductive layer from being over-etched.

15 8. The thin-film transistor structure according to claim 1, wherein said first conductive layer, said second conductive layer and said third conductive layer comprise a sandwich structure of AlNdN, AlNd and AlNdN alloys.

20 9. A thin-film transistor structure, at least comprising:
an transparent insulating substrate;
a gate electrode on said transparent insulating substrate;
a dielectric layer over said gate electrode;
25 a first semiconductive layer on said dielectric layer;
a second semiconductive layer on said first semiconductive layer;

a first AlNdN alloy layer on said second semiconductive layer;
an AlNd alloy layer on said first AlNdN alloy layer, said AlNd alloy layer is used as a source and a drain;
a second AlNdN layer on said AlNd alloy layer; and
5 an opening through said second semiconductive layer, said first AlNdN alloy layer, said AlNd alloy layer and said second AlNdN layer and exposing said first semiconductive layer.

10 10. The thin-film transistor structure according to claim 9, wherein said first AlNdN alloy layer has a thickness of about 500 angstroms.

11. The thin-film transistor structure according to claim 9, wherein said AlNd alloy layer has a thickness of about 2000 angstroms.

15 12. The thin-film transistor structure according to claim 9, wherein said second AlNdN alloy layer has a thickness of about 500 angstroms.

13. A thin-film transistor structure, said thin-film transistor structure comprising:

20 an insulating substrate;
a gate electrode on said insulating substrate;
a dielectric layer over said gate electrode;
a hydrogenated amorphous silicon layer on said dielectric layer;
an amorphous silicon layer on said hydrogenated amorphous
25 silicon layer;

a first conductive layer on said amorphous silicon layer;

an AlNd alloy layer on said first conductive layer, said AlNd alloy layer is used as a source and a drain; and

5 a second conductive layer on said AlNd alloy layer, said second conductive layer is used as a glue layer and to protect said AlNd alloy layer from being over-etched.

14. The thin-film transistor structure according to claim 13, wherein said first conductive layer prevents said AlNd alloy layer and said
10 amorphous silicon layer from diffusing into each other.

15. The thin-film transistor structure according to claim 13, wherein said first conductive layer and said second conductive layer
15 comprise AlNdN alloy layers.

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